

ACR0035-US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re the Application of: WEN-HSIN LIN ET AL. Serial No.: 09/871,993 Filed: June 4, 2001 For: IMAGE SENSING COMPONENT PACKAGE AND MANUFACTURE METHOD THEREOF | Art Unit: 2827 Examiner: Dinh, Tuan T. |
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AMENDMENT

Box: Non-Fee Amendment
Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action mailed on August 29, 2002, please amend the above-identified application as follows:

No extension of time or other fees are believed to be due, except as detailed in the attached documents. However, any extension of time necessary to prevent abandonment is hereby requested, and any fee necessary for consideration of this response is hereby authorized to be charged to Deposit Account Number 50-1390.

IN THE SPECIFICATION:

Please replace paragraphs the paragraph beginning at page 1, line 23; page 4, line 33; and page 6, line 4, as shown in the attached sheet(s).

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IN THE CLAIMS:

Please cancel claims 9-12 without prejudice or disclaimer and amend claim 1, as shown
in the attached sheet(s).

REPLACEMENT SPECIFICATION PARAGRAPHS

Please enter the following replacement specification paragraphs.

Paragraph beginning at Page 1, line 23:

Please refer to Figure 1, which shows a three-dimensional diagram of an image sensing chip, and generally the image sensing chip 10 is a complimentary metallic oxide semiconductor (CMOS) comprising: a glass plate 11, a carrier 12, and a printed circuit board 13; wherein a semiconductor being fixed in the middle of the printed circuit board 13 and having a plurality of conductive pads disposed on its external sides for receiving image signals through the glass plate 11. Please refer to Figure 2 for the description of the structure of the image sensing chip 10. The printed circuit board 13 is composed of a semiconductor 131, a conductive wire 132, and a substrate 133. The printed circuit board 13 is adhered onto the carrier 12, and then the glass plate 11 is mounted onto the carrier 12 to finish with the manufacture of the image sensing chip. The conventional image sensing chip generally utilizes the ceramic leaded chip carrier (CLCC) process for the manufacture, i.e. using ceramic carrier 12 as the package material for the process. Ceramic that has the characteristics of high hardness, thermal resistance, stability, and inactiveness is a very suitable material to be used for making the carrier. However, its source mainly comes from foreign suppliers that leads a high price, and in turn causes the total manufacture cost to increase in a large fold. Furthermore, during the manufacturing of the image sensing chip, the pressure of its interior must be greater than the atmospheric pressure. Therefore, when the image sensing chip being installed onto a device for use, the moisture of the air will enter into the image sensing component due to the change of pressure, and the water

vapor will permeate the image sensing chip easily and hence shorten the lifespan of the chip. Therefore, it is necessary to keep the internal pressure larger than the atmospheric pressure during the chip manufacturing.

Paragraph beginning at Page 4, line 33:

In Figure 1, an image sensing chip 10 is generally a complimentary metallic oxide semiconductor (CMOS) used in the optical image capture devices such as optical disk drives, digital cameras, or scanners, comprising a glass plate 11, a carrier 12, and a printed circuit board 13, wherein a semiconductor 131 is fixed in the middle of the printed circuit board 13 and has a plurality of conductive pads being formed on the external edge of the semiconductor 131 for receiving video signals through the glass plate 11. Figure 2 illustrates the layer structure of the image sensing chip 10 as illustrated in figure 1, wherein the printed circuit board 13 further comprises a semiconductor 131, a conductive wire 132, and a substrate 133, as illustrated in figure 3. The printed circuit board 13 is adhered onto the carrier 12, and then the glass plate is mounted onto the carrier 12 so as to complete the manufacture of the image sensing chip. The detailed manufacture process of the image sensing chip will be elaborated in later sections.

Paragraph beginning at Page 6, line 4:

Firstly, as shown in figure 3, the present invention has to achieve the automation for the manufacturing process of the image sensing chip 10, as shown in figure 1. The tray 20, as shown in Figure 2, is used. Such tray 20 has a plurality of accommodating grooves 21, and each

accommodation groove 21 penetrates the tray 20, and the surface area of the upper opening is approximately equal to that of the image sensing chip 10 and the surface area of the lower opening is slightly smaller than that of the upper opening, so that each of the same type of components (glass board 11, carrier 12, and printed circuit board 13) are accommodated into individual trays for processing. Hereafter, the description of the specification will use the following terms "main tray", "first tray" and "second tray" without numbering to indicate the tray 20. Please take the present invention for example, a plurality of printed circuit boards 13 are placed into a main tray (because it is unnecessary to remove the print circuit board 13 during the entire manufacturing process), a plurality of carriers 12 into a first tray, and a plurality of glass plates 11 into a second tray. In addition, to attain the automation for the process, the tray 20 also has a chip adhering mark 22 being disposed on a lateral side of the chip, and a conductive wire adhering mark being disposed on the corresponding side. Therefore, the tray 20 can be fixed in position by means of the chip adhering mark 22 and the conductive wire adhering mark 23 in the chip adhering step of the conductive wire adhering process. The entire manufacturing process can be accomplished by using the same tray 20. Of course, the tray 20 is not limited to the use for the PLCC packaging process, but it can be applied to the CLCC manufacturing process or other packaging process.

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

Claims 1-12 were pending in this application. Claims 9-12 have been cancelled and claim 1 has been amended hereby to correct matters of form. Accordingly, claims 1-8 will be pending herein upon entry of this Amendment. For the reasons stated below, Applicant respectfully submits that all claims pending in this application are in condition for allowance.

In the Office Action, the drawings were objected to and claims 1-8 were objected to under 35 U.S.C. §112 as containing subject matter which is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Further, claims 1-8 were rejected under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In addition, claims 1-8 were rejected under 35 U.S.C. §103 as being anticipated by Wetzel (U.S. Patent 6,268,231) in view of Berg et al. (U.S. Patent 5,756,380).

To the extent any of these objections or rejections might be again applied against the present application, they are respectfully traversed.

Drawing and Specification Objections

In response to Office Action, filed concurrently herewith is a Request for Approval of Drawing Corrections in which Figures 1 and 2 are designated as prior art.

With respect to the claimed features of “a main tray, a first tray, and a second tray”, Applicant respectfully directs the Examiner to page 6, lines 15-18 of the specification, which indicates that the same type of tray 20 is used for each of the main tray, first tray, and second tray. Accordingly, the tray feature is indeed shown in the drawings and described by the specification in such a way that would be clear to one of ordinary skill in the art.

Finally, Applicant has made corrections to the specification to address the issues raised in the Office Action.

In view of the foregoing, Applicant respectfully requests that the drawing and specification objections be reconsidered and withdrawn.

Rejection of Claims 1-8 under 35 U.S.C. §112

This rejection is respectfully traversed on the basis that the applicant has amended the language identified by the Examiner. Withdrawal of the rejection is therefore respectfully urged.

Rejection of Claims 1-8, under 35 U.S.C. §103

Claims 1-8 were rejected as being anticipated by Wetzel (U.S. Patent 6,268,231) in view of Berg et al. (U.S. Patent 5,756,380). This rejection is respectfully traversed. Wetzel discloses a “low cost CCD packaging”. However, the prior art disclosed by Wetzel does not disclose the claimed main tray, first tray, and second tray. Actually, in the prior art disclosed by Wetzel, the flexible circuit board 18, plastic ring frame 14, cover glass 16 are not placed in a main tray, a first tray, and a second tray respectively.

Wetzel fails to teach the claim 1 step of “dispensing said printed circuit board, and then capturing said carrier in said first tray onto each of said printed circuit board of said main tray.”

Besides, Wetzel (column 4, lines 5-6) describes "attaching the cover glass 16 to the ring frame 14 at the various interfaces", but do not mention a main tray and a first tray. So, Wetzel fails to teach the claim 1 step of "dispensing said glass plate, and then, collecting said carrier in said first tray to each said printed circuit board of said main tray."

Further, Wetzel (column 4, lines 1-23) describes "the cover glass 16 would be attached to the top open area of ring frame 14 by heat sealing," but do not emphasize its attaching working environment. Thus, Wetzel also fails to teach the step of "adhering said glass plate onto said carrier by thermal pressing in the high-pressure working environment."

Since the prior art (including Berg et al.) fails to teach each and every element recited by the claims recited in the present application, Applicant respectfully requests that the §103 rejection be withdrawn.

In view of the foregoing all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone applicant's undersigned representative at the number listed below.

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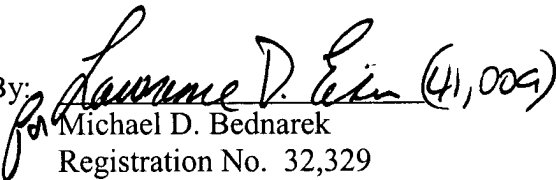
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Respectfully submitted,

WEN-HSIN LIN ET AL.

Date: November 27, 2002

By:

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Attachments: Amended Spec. w/ Markings
Amended Claims w/ Markings

MDB/LDE/ggb